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RELATIONSHIP BETWEEN QUANTITATIVE OPTICAL COHERENCE TOMOGRAPHY PARAMETER AND PRESSURE-DERIVED FRACTIONAL FLOW RESERVE FOR ASSESSING THE FUNCTIONAL SEVERITY OF CORONARY STENOSIS

i2 Poster Contributions
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Background: Optical coherence tomography (OCT) allows us to evaluate not only the qualitative coronary lesion morphology but also the quantitative anatomical severity of coronary stenosis. Fractional flow reserve (FFR) is an established index to evaluate the functional severity of a coronary stenosis. The aim of this study was to determine the OCT parameters for physiological severity of coronary stenosis.

Methods: Thirty-six coronary lesions in 34 patients, which were difficult to determine the hemodynamic significance only by visual assessment on angiogram, were assessed by means of quantitative coronary angiogram (QCA), OCT, and FFR. FFR was calculated as the ratio of the mean distal coronary pressure to the mean aortic pressure during maximal hyperemia. The minimal luminal diameter (MLD), minimal luminal area (MLA) and lumen area stenosis were measured by OCT.

Results: Although there was not correlation between QCA parameters and FFR, the FFR values were significant correlated with MLD ($r=0.59$, $p < 0.001$), MLA ($r=0.65$, $p < 0.001$) and lumen area stenosis ($r=-0.45$, $p=0.006$) respectively. The OCT thresholds for predicting the functional significant stenosis (FFR < 0.75) were MLD < 1.35mm (sensitivity 85%, specificity 69%, positive predict value: PPV 80.0%, negative predict value: NPV 61.9%), MLA < 1.91mm2 (sensitivity 85%, specificity 69%, PPV 77.3%, NPV 78.6%) and lumen area stenosis < 75.6% (sensitivity 60%, specificity 81.2%, PPV 73.9%, NPV 76.9%) respectively. Combining the OCT thresholds of both MLA and lumen area stenosis, PPV and NPV for FFR <0.75 were 85.7% and 75.0% respectively.

Conclusion: There was a significant correlation between OCT anatomical parameters and the FFR values. The MLD, MLA and lumen area stenosis measured by OCT can be anatomical predictors for the physiological significant coronary stenosis.